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Office of Pesticide Programs
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Attention: Ms. Christina Scheltema, Chemical Review Manager
Special Review and Reregistration Division

Subject : **Sodium Acifluorfen**: Evaluation of Preliminary Human Health and Ecological Risk Assessment

Dear Ms. Scheltema:

BASF Corporation is hereby submitting a 30 day error correction response to the preliminary risk assessment documents received from your office for sodium acifluorfen. BASF understands that the comments presented here are expected to be a discussion of gross errors and are not expected to constitute a comprehensive evaluation of the Agency's risk assessments. We will submit more extensive comments in a Phase 3 response which we understand will be due 60 days after the Agency has established a public docket for the preliminary human health and ecological risk assessment documents.

Presented below are our initial comments on the various reviews that have been provided by the Agency.

PRELIMINARY HUMAN HEALTH RISK ASSESSMENT

Health Effects Division Chapter

1. p. 2-3. References are made to the fact that offspring demonstrated increased susceptibility to acifluorfen in the rat teratology study. However, as discussed in the response to the Toxicology Chapter below, the results of this study and other toxicology studies indicate sufficient toxicity to parental animals at doses that produce the developmental effects. In addition, the developmental effects observed are growth delays observed in fetuses with reduced body weights and do not represent frank developmental toxicity, but are due to secondary effects of the reduced body weight. Therefore, there is no evidence of increased susceptibility of offspring to acifluorfen.

   Based on the lack of susceptibility to offspring, the FQPA safety factor should be removed for both chronic and acute risk assessments.

2. p. 3. Based on the discussion above, the acute population adjusted dose (aPAD) should use only a 100X safety factor resulting in a value of 0.2 mg/kg/day.

As discussed in number 7 under the HED Toxicology chapter below, the correct NOAEL for the chronic population adjusted dose (cPAD) should be 7.5 mg/kg/day from the chronic dog study. No FQPA safety factor is needed so the cPAD would be 0.08 mg/kg/day.

3. Page 3, q1* value. As indicated previously, it is BASF's position that a quantitative low dose extrapolation is not appropriate for acifluorfen. A position document will be sent with the Phase 3 response. If a q1* is calculated, there appear to be errors in the Agency's calculation.

   Several corrections would need to be made to the q1* calculation:

   - Apparently a surface area conversion of body weight $^{2/3}$ was used. The current default is to use body weight $^{3/4}$
   - In the EPA incidence table, to determine adenomas or carcinomas it appears some animals were double counted. An animal with one or both of these tumors should be counted only once.
   - It appears that some animals were considered that were interim sacrificed because the number of animals considered is greater than 50 in some cases. Interim sacrificed animals are typically not considered because they did not live long enough to produce tumors.
   - Mean test material intake reported in the study should be used instead of default parameters.
   - A significant dose-related trend in the incidence of early deaths in treated male mice must be considered. It is more appropriate to use the Multistage-Weibull Time-to-Tumor model.

BASF has recalculated the q1* using the corrections above and has determined the following values:

Data Set	**Q1* (mg/kg bw/day)$^{-1}$**	
Male Mice	Time to tumor analysis	
Liver		
Adenomas or carcinomas	1.27×10^{-2}	
Carcinomas	4.02×10^{-3}	
Stomach		
Papillomas	6.79×10^{-4}	
Female Mice	Time to tumor	Quantal
Liver		
Adenomas or carcinomas	5.85×10^{-3}	5.53×10^{-3}
Carcinomas	1.71×10^{-3}	1.71×10^{-3}
Stomach		
Papillomas	2.91×10^{-3}	2.63×10^{-3}

Based on these results, the most conservative q1* calculation is 1.27 X 10-2 which should be used for linear low dose extrapolations.

6. p. 9, Table 2. For the two-generation reproduction study the NOAEL for offspring toxicity is given as 1.25 mg/kg/day. This should be 50 mg/kg/day as discussed in detail in the discussion of the Toxicology Chapter, response number 5.

7. p. 11, Table 3. The acute and chronic PAD's should be adjusted as discussed above. The NOAEL used for short-term and intermediate-term dermal exposure should be 300 mg/kg/day from the 21-day dermal toxicity study in rabbits. This is discussed in detail in the Toxicology Chapter, response number s7.

Toxicology Chapter

1. p. 5, Table 1. The acute oral toxicity in rats is given as 1540 mg/kg for the 40% a.i. This contradicts the data presented in "HED Chapter for the Reregistration Eligibility Decision" document (page 7) which gives the rat oral LD50 for the 20.2-23.25% a.i. material as 2025 mg/kg (males) and 1370 mg/kg (females). The latter study is more recent and gives both male and female data. It is suggested that the LD50 data on Tackle (20.2 - 23.25% a.i.) be used consistently in both documents. This would also be consistent with the use of Tackle for the remainder of the acute toxicity testing categories.

2. p. 8. A study on the subchronic toxicity in mice is classified as "Unacceptable/guideline but upgradeable". No reason is given for the "unacceptable" classification.

3. p. 10-11, Mouse oncogenicity study (MRID 00122732). It should be added to the review that the high dose in this study (2500 ppm) exceeded the MTD for both male and female animals. In males there was a statistically significant increase in mortality and a body weight decrease of 25% compared to controls at week 79. In females, there was a body weight decrease compared to controls of 34% at week 79. Additional toxicity at the high dose included increased liver weight and the presence of white foci and/or ulcers in the stomach. Mortality is certainly an indication that the dosing was too high, and body weight differences of greater than 20% exceed the MTD criteria.

   It should also be noted that the stomach papillomas observed in males and females were significantly increased over control only at the high dose which exceeded an MTD. There is evidence in this study that acifluorfen was irritating to the gastrointestinal tract, and other studies have shown this compound is irritating to mucous membranes. By exceeding the MTD with an irritating dose to the stomach, alterations to this organ occur which are not representative of human exposure. Therefore, the stomach papillomas should not be considered in risk assessments for acifluorfen.

   The liver tumors in this study were increased only at the high dose in females and in males at the low and high (not the mid) doses. With the lack of a dose response, it can be determined that a biologically relevant liver tumor increase only occurred at the high dose in both sexes which exceeded the MTD. Therefore, these tumors should not be considered in risk assessments for acifluorfen. In addition, there is evidence that acifluorfen and chemicals of similar chemistry produce liver tumors at very high doses via a threshold mechanism of peroxisome proliferation. BASF will present a position paper on this issue during the Phase 3 review process.

4. p. 16, Reproductive toxicity in rats, 5th paragraph. It is stated that in the F2 generation, the incidence of pups dying between lactation days 1 and 4 was significantly increased for the mid and high dose groups when compared to controls. However, the difference from control at the mid dose is considered spurious and not related to treatment because: (1) the incidence is similar to the test facility historical control data, (2) pup survival from day 1 to 4 for the mid dose group was 99.3% compared to the control value of 99.0% and (3) the increased incidence of pup deaths at the mid dose was primarily due to the loss of all pups in one litter. As there were no treatment-related effects in offspring at the mid dose of 500 ppm (50 mg/kg/day), this should be considered the NOAEL for offspring toxicity.

5. p. 17, Mutagenicity. The report states that acceptable genetic toxicology studies indicate that sodium acifluorfen was weakly positive in a few assays and negative in the remainder. BASF believes that when all the genotoxicity data collected for acifluorfen are considered, the weight of the evidence indicates that it is not genotoxic. A review paper will be prepared and presented to the Agency during the Phase 3 review process.

6. p. 20, FQPA Considerations/Uncertainty Factor. The report states that the FQPA 10X safety factor should be retained due to increased sensitivity of offspring observed in the developmental toxicity study in rats for acute dietary and short-term/intermediate-term residential (non-occupational) exposures for the females 13-50 and infants and children subgroups. However, the factor should be reduced to 3X for assessing the chronic dietary and long-term residential (non-occupational) exposures for the females 13-50 and the infants and children subgroups.

   The EPA review indicated that increased sensitivity was based upon results from the developmental toxicity study in rats, which demonstrated dilated lateral ventricles of the brain in pups at the mid dose which had minimal maternal toxicity. However, when the overall toxicology of acifluorfen is considered, there is no evidence of offspring toxicity at a dose without substantial parental toxicity. As the EPA review states, the NOAEL's for both maternal and developmental toxicity are the same at 20 mg/kg/day. There was a clear NOAEL for all effects with no difference in dose level of effect between parent and pup. Maternal toxicity was clearly evident at the mid dose of 90 mg/kg/day by clinical signs and a decrease in body weight gain of 7% during the treatment period. In addition, a similar dose of 125 mg/kg/day in the 90-day rat feeding study produced hematology effects and liver and kidney toxicity. The same dose of 125 mg/kg/day produced kidney toxicity in the two-generation reproduction study. Pup toxicity observed in the rat developmental study was decreased fetal body weight and increased variations. Fetal weights were decreased at the mid and high doses by 9 and 19% compared to controls. This decrease in body weight is often associated with a delayed development. This was evidenced in the pups by delayed skeletal ossifications and a slight dilation of the lateral ventricles of the brain. At the mid dose of 90 mg/kg/day, the dilation of brain ventricles was observed in 10 pups from 8 litters. The average pup weight from each of these litters was below the control average by 14% demonstrating these were small pups which would have developmental delays. The increase in incidence of these developmental delays does not indicate a frank developmental toxicity of the chemical, but an indirect effect of small pups.

   Further support for the lack of sensitivity for young is given in the two-generation rat reproduction study with acifluorfen. A clear NOAEL was obtained

for developmental effects as it was in the teratology study. There was also no indication of sensitivity of offspring.

In conclusion, there is no evidence of increased sensitivity for offspring and no need for an additional safety factor. The FQPA safety factor should be removed for both short-term and chronic assessments.

7. p. 21, Table 2. The chronic dietary non-carcinogenic NOEL is given as 1.25 mg/kg/day from the two-generation rat reproduction study. However, the NOEL from the rat chronic/oncogenicity study of 25 mg/kg/day must be considered. As discussed in number 6 above, there were no treatment-related effects on pups at the mid dose of the rat reproduction study of 50 mg/kg/day. However, there was systemic kidney toxicity to the parents at 50 mg/kg/day with the NOAEL being 2.5 mg/kg/day. In the chronic toxicity study in rats, a dose in between these two doses of 25 mg/kg/day was tested without systemic toxicity. Therefore, the overall NOAEL for chronic systemic toxicity in the rat is 25 mg/kg/day. Considering all multiple dose oral studies with acifluorfen the lowest dose would be 7.5 mg/kg/day in the chronic dog study. This dose should be used for the chronic RfD.

   A q1* is given as 3.55 X 10-2. This is based on tumors in a mouse oncogenicity study. As indicated in number 3 above, these tumors occurred only at a dose that exceeded the MTD and are produced by threshold mechanism. BASF will present a position paper during the Phase 3 review process indicating that a threshold (MOE) approach should be used for cancer risk assessment and that a linear low-dose extrapolation is not appropriate.

   The short-term and intermediate-term dermal NOEL's are from the oral rat teratology study. As indicated in number 6 above, there was no increase in sensitivity of the young or unborn to acifluorfen. Based on this fact, all studies can be considered. For dermal risk assessment considerations it is more appropriate to use a route to route comparison. The NOEL for systemic toxicity in a 21-day dermal toxicity study in rabbits was 300 mg/kg/day. This should be used for dermal risk assessments.

HED Metabolism Assessment

1. p. 4. The Agency states that no Canadian tolerances have been established. Sodium acifluorfen is registered for use on soybeans in Canada, with residues of sodium acifluorfen and its metabolites not to exceed 0.1 ppm.

2. p.7. Sodium acifluorfen is classified as a nontranslocated contact herbicide. It enters through the leaves and rapidly acts to destroy cell membranes. Rapid destruction of cell membranes prevents translocation to other regions of the plant.

3. p. 8. The Agency states that if residues of sodium acifluorfen reach groundwater, they will persist indefinitely. Results from an anaerobic aquatic metabolism study (MRID 43155201) have shown that under anaerobic aquatic conditions, the compound is rapidly degraded, with a half-life of approximately 2.7 days.

Occupational and Non-Occupational Exposure and Risk Assessments

1. BASF has found errors in several of the exposure/risk calculations and disagrees with some of the conclusions reached in this document. Our response is presented in Appendix 1. Overall, BASF has shown that, even when using the Agency's conservative assumptions, acceptable risks have been demonstrated.

PRELIMINARY ECOLOGICAL EFFECTS RISK ASSESSMENT

1. p.1. EPA states that its ability to predict the fate or concentrations of acifluorfen in soil or water has considerable uncertainty and that additional studies are needed to better define the persistence of the compound in the environment. BASF would like to point out that the Agency has stated elsewhere in this document that all environmental fate guidelines have been adequately fulfilled. BASF believes that laboratory and field data do present a consistent picture of the fate of the compound in the environment and BASF does not believe that conducting additional studies will add more to this understanding. BASF will present a more detailed evaluation of this issue in the Phase 3 response.

2. p.5. The maximum concentration of sodium acifluorfen in a currently registered end use product is 20.1%.

3. p.5. Use Characterization: BASF considers the market information which is presented to be Confidential Business Information. In addition, BASF would like to point out that these marketing data do not reflect the current reality of the agricultural marketplace. Due to the impact of biotechnology, especially in the soybean market, the acreage estimates for sodium acifluorfen-containing products have been significantly reduced over the past two years. In its Phase 3 response, BASF will present a more current quantitative use assessment.

4. p. 13. On this page, and in Appendix E, the Agency states that there is no foliar dissipation study for sodium acifluorfen and therefore EPA assumes a half-life of 30 days. BASF has submitted a study (MRID 44091101) which shows a foliar dissipation half-life of approximately one day with no detectable residues observed after 3-5 days.

5. p. 13. The Agency states that chronic risk to birds is anticipated. In arriving at this conclusion an assumption of a 30-day half-life is made. As stated above in point 4, a half-life of one to less than one day was reported in a soybean foliar dissipation study conducted at the maximum seasonal application rate (MRID 44091101). BASF therefore contends that exposure to acifluorfen will be significantly less than the review anticipates and that chronic risk to herbivorous and insectivorous birds will be minimal.

6. p. 27. On this page and on following pages, including Appendix J, EPA cites a number of studies, data and calculations for lactofen in the course of its drinking water exposure analysis. BASF does not have access to the data for lactofen to which the Agency refers and therefore cannot evaluate this information with confidence.

7. p. 29. EPA has used the SCI-GROW model to estimate potential ground water concentrations for acifluorfen and acifluorfen as a degradate of lactofen under hydrologically vulnerable conditions. BASF does not agree

with the Agency's use of certain values in the SCI-GROW calculations and has data that contradict certain of the values that were used in the modeling exercise. BASF will present a detailed evaluation of the EPA's drinking water exposure assessment in the Phase 3 response.

8. pp. 55, 56. Appendix D. Typographical error. The units used in the tables for the EC50 values should be in ppb, rather than ppm.

9. p. 63. Appendix F. These data should be considered Confidential Business Information.

PRODUCT CHEMISTRY CHAPTER

1. p. 3. On page 3, EPA discusses the regulatory history of sodium acifluorfen as it pertains to the product chemistry which supports currently registered sodium acifluorfen products. The discussion is slightly in error. In actuality, Rohm and Haas Company was the first registrant of sodium acifluorfen. This first registration was granted for the Rohm and Haas product Blazer herbicide in 1980. In 1987, BASF purchased the registration and data that supported that product. BASF contracted for the toll manufacture of the active ingredient at the Rohm and Haas facility in Bayport, Texas. Rohm and Haas has continued to toll manufacture the active ingredient for BASF under the Rohm and Haas process since the purchase and continues to produce sodium acifluorfen using that original manufacturing process. Under the requirements of PR Notice 87-7, BASF registered the sodium acifluorfen MUP that is produced at the Rohm and Haas facility so that product could be moved from Bayport, Texas to various BASF formulating facilities.

   In 1984, Rhone-Poulenc registered its own sodium acifluorfen product, Tackle. They used a slightly different manufacturing process; material was produced in a separate facility in Tennessee. In 1992, Rhone-Poulenc relinquished its sodium acifluorfen business and sold its database for sodium acifluorfen to BASF. Rhone-Poulenc no longer maintains any registrations for Tackle.

   The product chemistry database that BASF has submitted to EPA under the requirements of FIFRA '88, and that EPA has found to be acceptable, has been generated for material produced in the Rohm and Haas production facility.

2. p. 2. Bulk density packed should be 32.08 lb/ft3.

3. p. 6. 830.1750 Certified Limits. This study is required for a TGAI. The submitted study has been assigned MRID 41891203.

4. p. 6. 830.1800 Enforcement Analytical Method. This study is required for a TGAI; the submitted study was assigned MRID 41891202.

STORAGE STABILITY, ANALYTICAL METHODOLOGY AND ROTATIONAL CROPS

1. p. 17. In the second paragraph, the agency states that no radiovalidation data have been submitted for the enforcement method (PAM II), and these remain outstanding. BASF believes that the radiovalidation experiments are of little value based on the low residue situation which exists for sodium

acifluorfen in seeds or grains. Residues of concern in the metabolism studies are at or below the limits of quantitation for the final analytes. BASF believes that the nature of the extraction scheme in the enforcement method is chemically reasonable for releasing any residues of concern. The metabolism studies have shown good extractability of the residues of concern in organic solvents such as methanol. The acetonitrile/aqueous acidic extraction techniques involved in the enforcement method are expected to be at the least as efficient if not more so. BASF believes radiovalidation would produce at the best marginal data because of the low residue levels.

2. p. 18. In the paragraph which continues from page 17, the agency states that the validated limit of quantitation is 2.05 ppm for rice straw (0.05 ppm for acifluorfen and acifluorfen methyl ester and 2.0 ppm for acifluorfen amine and its methyl ester). The agency in addition states that this LOQ is above the level determined in the rice straw (<0.124 ppm). BASF disagrees with the claim of 2.0 ppm as the LOQ for acifluorfen amine and its methyl ester. Recoveries were demonstrated for acifluorfen, its methyl ester, acifluorfen amine, and its methyl ester, all at the 0.05 ppm level. The recoveries for the amine metabolite were lower than the other compounds at 55+/-9 (n=8), but the precision was good with a standard deviation below 10%. In addition, during the analyses of the crop field trial straw samples (MRID 43584502), concurrent recoveries of the amine metabolite at levels of 0.05 and 0.2 ppm ranged from 70-80 (five recovery samples run in total). BASF believes the limit of quantitation of 0.05 ppm for each analyte is appropriate.

3. p. 18. In the second paragraph, the agency states adequate radiovalidation data must be submitted before the method (D9205) can be considered acceptable for tolerance enforcement purposes. BASF is satisfied with having the current PAM II method as the enforcement method. BASF also considers the extraction procedure in D9205 to be more exhaustive than the enforcement method, and thus has not confirmed the method by radiovalidation. The enforcement method uses an acetonitrile/acidic aqueous solvent for extraction. The data collection method first uses an aqueous basic soak followed by an acetonitrile/acidic aqueous solvent.

4. p. 22. The first paragraph states that 14C-residues >0.1 ppm accumulated in/on all rotational crop commodities of chard, turnip, sorghum, wheat, and radish planted 39, 103, 145, 313, and/or 370 days following application. This statement is inaccurate. For fall rotational crops (103 and 145 days), only chard had total residues >0.1 ppm. Radish roots and tops, and wheat forage, straw, and grain contained residues all <0.1 ppm. For the annual plant back (313 and 370 days), total residues were <0.04 ppm.

5. p. 23. The conclusion states that based on these results, the labels for sodium aciflurofen must be amended to specify a 12-month plantback interval (PBI) for rotated crops; a 6-month PBI would be acceptable for small grain crops. BASF does not agree with this conclusion. Although total residues are greater than 0.01 ppm for most of the samples, the residues would not be detectable with the given methodology. In both the enforcement and data collection methodologies, residues of sodium acifluorfen, which include the acid and salt version of acifluorfen, the methyl ester of acifluorfen, the amine metabolite and its methyl ester, are determined as a combination of two final analytes. In the enforcement method, all residues of concern are converted to either the methyl ester of acifluorfen or the heptafluorobutyric amide equivalent of the amine metabolite. In the data

collection method, all residues of concern are converted to either the methyl ester of acifluorfen or the amine metabolite. The collective limit of quantitation (LOQ) for the final analytes sums to 0.1 ppm, 0.05 ppm per analyte. Because acifluorfen has a no quantifiable residue situation in most crops (rice grain, peanut nutmeat, and soybeans), tolerances have been set at the 0.1 ppm LOQ. Based on either the enforcement or the data generation methods, residues of acifluorfen would not be measurable. The only residue of concern identified in the confined study was acifluorfen, and this component never exceeded 0.024 ppm, even at the 39 day emergency plant back interval. This value is well below the 0.1 ppm tolerance which is based on the methodology LOQ. Based on this information, BASF feels that no plant back restrictions based on the residue situation should exist for sodium acifluorfen.

RESIDUE CHEMISTRY CHAPTER

1. p. 11. BASF currently maintains registration for 6 end use sodium acifluorfen products. A sixth product, Conclude Xact (EPA Reg. No. 7969-179), was registered by EPA on March 29, 2000.
2. pp. 17,18,22,23. Comments on the conclusions drawn by the Agency that appear on these pages have been presented above under Storage Stability, Analytical Methodology , and Rotational Crops.

If you have any questions on this information, please contact me at (919) 547-2979.

Sincerely,
BASF Corporation
Agricultural Products

Karen R. Blundell
Registration Scientist

Appendix 1: Occupational and Residential Exposure and Risk

Comments on the following documents:

1. **Sodium Acifluorfen:** Occupational and Non-Occupational Non-Cancer and Cancer Exposure and Risk Assessments for the Reregistration Eligibility Decision (RED) Document [Case #819467, PC Code 114402, DP Barcode D252558]. 30 May 2000. Catherine Bodurow Joseph *Through* Susan Hanley *To* Kit Farwell.

2. **Sodium Acifluorfen:** HED Chapter for the Reregistration Eligibility Decision Document. DP Barcode D25255. PC Code 114402. Submission S555157. Tox. Chem. No. 755D. 31 May 2000. Kit Farwell *Thru* Wang Phang *To* Christina Scheltma and Susan Stanton.

Comments are directed at the more detailed Reference 1, but the comments and errors resulting in changes to Reference 1 should also be carried over to Reference 2.

GENERAL COMMENTS

1. The Agency states that no chemical-specific handler exposure studies are available. However, BASF has submitted the study "Passive Dermal Dosimetry and Biological Monitoring of Exposures of Mixer/Loaders and Applicators to Blazer (Acifluorfen-Sodium) Herbicide Applied by Ground Boom Equipment." 10 June 1992. MRID 42361501.

   These biomonitoring results conclusively demonstrated that the EPA estimate of 20% percutaneous absorption and the PHED surrogate rates of dermal exposure vastly overestimate exposure. This provides additional comfort for handler safety that was demonstrated using conservative default assumptions and calculations.

2. The Agency states that no chemical-specific dislodgeable foliar residue studies were available. However , BASF has submitted a study examining foliar dislogeable residues of sodium acifluorfen on soybeans (MRID 44091101).

   The soybean study included 15 replicates in three states using a 0.125 lb/A application followed by a 0.375 lb/A application. The total of 0.5 lb/A is the maximum annual application rate and 0.375 lb/A represents the maximum single application rate. The mean Day 0 DFR was 0.424 µg/cm^2 at the maximum application rate compared to the EPA predictions of:

   0.84 µg/cm^2 at 0.375 Lb AI/acre
   0.56 µg/cm^2 at 0.250 Lb AI/acre
   0.42µg/cm^2 at 0.188 Lb AI/acre
   0.38µg/cm^2 at 0.168 Lb AI/acre
   0.35µg/cm^2 at 0.158 Lb AI/acre

   The DFR study also demonstrated a decay that is much faster than the default value of 10%/day. The determined DFR value and decay curve should be used instead of default values to calculate reentry exposure. BASF will submit detailed exposure calculations during the Phase 3 comment period.

Comments on Mixer/Loader and Applicator Exposure and Risk

3. The current label for acifluorfen formulation is the EPA occupational "Baseline" scenario plus the use of waterproof gloves and eye protection. None of the occupational handler scenarios in Reference 1 match a labeled use. The minimal PPE scenario includes respiratory protection, which is not a label requirement for sodium acifluorfen end-use products. Another scenario should be calculated using the label PPE.

4. BASF believes that it is a deviation from Agency practice to use females 13-50 years of age with bodyweights (BW) of 60 kg as the scenario for cancer risk assessment. The practice is to use a standard 70 kg BW, resulting in lower risks.

5. In Reference 1, the exposure of groundboom mixer/loader/applicators is assessed. Historically, the Agency has evaluated mixer/loaders separately from applicators, and these scenarios should be included.

6. The labels for acifluorfen formulations indicate aerial application rates that involve significant dilution, i.e. 5-10 gallons/acre. With this dilution, we expect that it would not be possible for aerial applicators to treat 1,200 acres/day. BASF will submit information on aerial application use during the Phase 3 comment period.

7. BASF believes that the burden of showing acceptable risks (including cancer risks) under the Agency's conservative assumptions has been met. This is supported by the results of the worker exposure study with acifluorfen which showed actual systemic exposure to be much less than that predicted by the PHED modeling, adding additional confidence for worker safety.

8. Miscellaneous errors noted and suggested clarifications include:

   At Page 9, Lines 2 and 3, delete the terms "loader/applicator, handler/bagger".

   In Tables 7 and 8 at Page 28; and Tables 1 and 2, Appendix C at Pages 65 and 66, the word "exceed" should be replaced with "are less than".

   In Appendix B, Tables 1 and 12: An explanation of how the unit exposure values were determined for the ground boom mixer/loader/applicator (Scenario 5) (Pages 12 and 63) would be useful.

9. In Appendix B, Tables 6, 7, 8, and 9, beginning at Page 33, the high rate of 0.375 is dropped for peanuts and soybeans and a new rate of 0.188 Lb AI/acre is evaluated for soybeans (from the "Closure Memo" in Appendix A, Page 4). This new next-to-maximum rate also carries the greatest use frequency, 3 and 30 days for private and professional applicators. An explanation of this scenario would be useful.

10. In Appendix B, Tables 6, 7, 8, and 9, beginning at Page 33, the Agency lists acres/day and days/year for private and professional handlers. The aerial application and groundboom parameters are reproduced below. An explanation of the rationale for assigning days/year to the different application rates would be useful.

Crop	Lb AI/A	A/day	Days/Year	
			Priv.	Pro.
Aerial application:				
Peanuts	0.250	350	2	20
Rice	0.125	350	2	20
Rice	0.125	1200	2	20
Rice	0.250	350	1	10
Rice	0.250	1200	1	10
Soybeans	0.158	350	1	10
Soybeans	0.158	1200	1	10
Soybeans	0.168	350	2	20
Soybeans	0.168	1200	2	20
Soybeans	0.188	350	3	30
Soybeans	0.188	1200	3	30
Soybeans	0.250	350	2	20
Soybeans	0.250	1200	2	20

Crop	Lb AI/A	A/day	Days/Year	
			Priv.	Pro.
Groundboom:				
Peanuts	0.250	80	2	20
Rice	0.125	80	2	20
Rice	0.125	200	2	20
Rice	0.250	80	1	10
Rice	0.250	200	1	10
Soybeans	0.158	80	1	10
Soybeans	0.158	200	1	10
Soybeans	0.168	80	2	20
Soybeans	0.168	200	2	20
Soybeans	0.188	80	3	30
Soybeans	0.188	200	3	30
Soybeans	0.250	80	2	20
Soybeans	0.250	200	2	20

Reentry exposure and risk

11. In Appendix C the Agency does a post application assessment of exposure during scouting and irrigating. BASF believes that the underlying model is overly conservative. For example:

    - The model assumes reentry on the specified day—8 hours per day each and every time a field is reentered—for the assumed 10 or 20 days per year for 35 years.
    - The default DFR is based on a single-sided planar surface area, but the registered crops are multi-surfaced—DFR are overestimated and Transfer Coefficients are based on 2-sided leaves.

12. EPA states that “typical (or average) [use rates]” will be used for cancer risk (See text Page 13 and 15)—but then also evaluates maximum use rates. It is unlikely that any person will reenter and work 8 hours/day in fields treated at the maximum rate on Day 0 for 20 days per years for 35 years.

Residential

13. At text Pages 16, 29, and 22, EPA states:
"For the residential applicator assessment of acifluorfen, it was assumed that one 24 fluid ounce container would be used by an applicator for spot treatments in one year....for 50 years over a 70 year lifespan (p. 16).
...assumptions included: 1) a residential applicator may make 10 spot treatments[s]...in one year, 2) spot treatment applications in one year would use one container (24 fluid ounces), 3) residential applicators may have 50 years potential exposure over a 70 year lifespan (p. 29)
.....residential PHED values represent ....wearing typical residential clothing of short-sleeved shirt, short pants, and no gloves. (p, 22)."
A margin of exposure of 140 and a cancer risk of 2.7E-03 are reported at text Page 29. The exposure model is given in Appendix D, Tables 1 and 3 at Pages 69-70 for MOE only—a cancer assessment calculation is not presented (it appears to have been Table 2, which was not included in the document).

We believe that the calculated exposures are in error and we present alternative calculations with the same PHED surrogate data in the following Table. Table 1 uses PHED rates for aerosol cans and estimates a dermal rate of 220 from the PHED rate of 190 mg/Lb AI for long pants and long-sleeved shirt. We believe this rate is conservatively excessive for an RTU liquid and that the clothing scenario would not occur for 50 years of use. The inhalation rate of 2,400 µg/Lb AI in Table 1 does not correspond to the PHED rate of 1,300 µg/Lb AI—we use the PHED rate in the calculations below even though we think it excessive for a liquid RTU which produces a very coarse (large diameter) aerosol.

- The recalculated residential handler MOE of 141,500 should not be of concern to the Agency and will have negligible impact on aggregate risk.

- The recalculated residential handler cancer risk of 9.8E-08 should not be of concern to the Agency and will have negligible impact on aggregate risk.

Residential handler exposure to acifluorfen.
Filename ACI Residential Handler.xls

	220	A. Dermal mg/Lb AI handled
	1.3	B. Inhalation mg/Lb AI handled
	24	C. Fluid ounces per container.
	1.56	D. Lb per container.
	0.12%	E. Percent AI
D*E	0.001872	F. Lb AI per container.
	1	G. Container/year
	10	H. Applications per year
F/H	0.0001872	I. Lb AI/application
I*A	0.041184	J. mg dermal exposure/application
	20%	K. Percutaneous absorption
	60	L. kg BW, female
J*K/L	0.00013728	M. mg/kg BW absorbed dermal dose/application
I*B/L	0.000004056	N. mg/kg BW inhalation dose/application
M+N	0.000141336	O. mg/kg BW total absorbed dose/application
	20	P. NOAEL: mg/kg BW
P/O	**141,507**	**Q. MOE, short and intermediate term.**
	50	R. years exposure
	25,550	S. Lifespan, days: 70 yr * 365 d/yr
O*H*R/S	2.766E-06	T. Lifetime average daily dose
	0.0355	U. Q*1: $(mg/kg/day)^{-1}$
T*U	**9.8E-08**	**V. Cancer Risk.**

TABLE 1